

# CLAIMS

What is claimed is:

1. A method of training an equalizer based on a packet including a preamble segment, a header segment and a payload segment, wherein each of said segments has a symbol rate and said equalizer has a plurality of filter taps, said method comprising the steps of:

adapting said plurality of filter taps according to said preamble segment;

extracting from said header segment a symbol rate value of said payload segment;

determining whether said symbol rate value indicates that said symbol rate of said payload segment is higher than said symbol rates of said preamble and header segments; and

re-adapting said plurality of filter taps according to said preamble segment if said determining step determines that said symbol rate of said payload segment is higher than said symbol rates of said preamble and header segments;

wherein, for said re-adapting step, a plurality of zeros are inserted into said preamble segment to account for the difference between said symbol rate of said payload segment and said symbol rate of said preamble segment.

2. The method of claim 1, wherein a plurality of zeros are inserted in said header segment to account for the difference between said symbol rate of said payload and said symbol rate of said header.

3. The method of claim 1, wherein said symbol rate of said preamble segment and said symbol rate of said header segment are the same.

4. The method of claim 1, wherein said symbol rate of said preamble segment is two MSPS and said symbol rate value in said header segment indicates four MSPS.

5. The method of claim 4, wherein a zero is inserted between each symbol of said preamble segment.

5 6. The method of claim 5, wherein a zero is inserted between each symbol of said header segment.

7. The method of claim 1 further comprising the step of forcing a zero decision when a zero is inserted into said preamble segment.

8. A communications device capable of receiving a packet including a preamble  
10 segment, a header segment and a payload segment, wherein each of said segments has a symbol rate, said communications device comprising:

a processor capable of extracting from said header segment a symbol rate  
value of said payload segment and capable of determining, based on said symbol rate value,  
whether said symbol rate of said payload segment is higher than said symbol rates of said  
15 preamble and header segments; and

an equalizer capable of inserting a plurality of zeros into said preamble and  
header segments, if said processor determines that said payload segment is higher than said  
symbol rates of said preamble and header segments;

wherein said equalizer includes a decision block capable of forcing a zero  
20 decision when a zero is inserted into said preamble and header segments.

9. The communications device of claim 8, wherein said symbol rate of said preamble segment is two MSPS and said symbol rate value in said header segment indicates four MSPS.

10. The communications device of claim 9, wherein a zero is inserted between each symbol of said preamble segment.

11. The communications device of claim 10, wherein a zero is inserted between each symbol of said header segment.

12. The communications device of claim 8, wherein said equalizer is a decision feedback equalizer.

13. The communications device of claim 8, wherein said equalizer includes a feedforward filter and a feedback filter.

14. The communications device of claim 8, wherein said equalizer is a linear equalizer.

15. A method of training an equalizer based on a packet, including a preamble segment, a header segment and a payload segment, wherein each of said segments has a symbol rate, said method comprising the steps of:

buffering said packet in a memory;

processing said preamble segment;

extracting a symbol rate value of said payload segment from said header segment;

inserting zeros in said preamble and header segments buffered in said memory according to the difference between said symbol rate value of said payload segment and said symbol rates of said preamble and header segments; and

re-processing said preamble and header segments after said inserting step.

16. The method of claim 15, wherein said equalizer includes a plurality of filter taps, and wherein said processing step includes adapting said plurality of filter taps.

17. The method of claim 16, wherein said re-processing step includes re-adapting said plurality of filter taps.

18. The method of claim 15, wherein said buffering step is performed concurrently with said processing step.

5 19. The method of claim 15 further comprising the step of forcing a zero decision when a zero is inserted into said preamble and header segments.

20. The method of claim 15, wherein said symbol rate of said preamble segment and said symbol rate of said header segment are the same.

10 21. The method of claim 15, wherein said symbol rates of said preamble and header segments are two MSPS and said symbol rate value in said header segment indicates four MSPS.

23. The method of claim 21, wherein a zero is inserted between each symbol of said preamble and header segments.

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